IXODIDAE TICK INFESTATION IN HUMANS IN MARANHÃO STATE, BRAZIL

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ABSTRACT

Ticks are ectoparasites of the Ixodidae family in a wide variety of hosts that includes almost all species of wild and domestic mammals, and also parasitize birds, reptiles, amphibians and can infest human The aim of this study was to report human parasitism, by ticks, in the Area of Environmental Preservation of Inhamun, in Maranhão State, Brazil. During research activities, from 2005 to 2011, 49 specimens of ticks were found parasiting man and were identified as *Amblyomma cajennense* and *Amblyomma parvum*. These ticks have low specificity to hosts, especially in the larval and nymph stages, and they are vectors of pathogens. For these reasons, the species that belongs to the *Amblyomma* genus requires close attention.
KEYWORDS: Ixodidae, human, Inhamum

INFESTAÇÃO POR CARRAPATOS IXODÍDEOS EM HUMANOS NO ESTADO DO MARANHÃO, BRASIL

RESUMO

Carrapatos são ectoparasitos da família Ixodidae de uma variedade de hospedeiros que incluem quase todas as espécies de mamíferos silvestres e domésticos, também parasitam aves, repteis e anfíbios e podem infestar o homem. O objetivo do trabalho foi relatar o parasitismo humano, por carrapatos, na Área de Preservação Ambiental do Inhamum, no estado do Maranhão, Brasil. Durante atividades de pesquisa, de 2005 a 2011, 49 espécimes de carrapatos foram encontrados parasitando humanos e foram identificados como *Amblyomma cajennense* e *Amblyomma parvum*. Os carrapatos tem baixa especificidade de hospedeiros, especialmente nos estágios de larva e ninfa e são vetores de patógenos, desta forma, as espécies que pertencem ao gênero *Amblyomma* requerem atenção.
PALAVRAS-CHAVE: Ixodidae, humano, Inhamum

INTRODUCTION

There are around 870 species of ticks described around the world, all under the Ixodida suborder. Ixodida is divided into three families – Argasidae, Nuttalliedae and Ixodidae. The ticks popular known as hard ticks, with approximately 683 described species, are part of the Ixodidae family. The Neotropical region is represented by 117 species, included in five genus (*Amblyomma*, *Dermacentor*, *Haemaphysalis*, *Ixodes, Rhipicephalus*) (BARROS-BATTESTI et al., 2006).

During the parasitism they cause sanguineous exploitation because of the haematophagy, discomfort to the hosts, local irritation, and anemia by blood loss, and can even inoculate toxins. Some species are vectors of pathogens, such as *Babesia*, *Ehrlichia*, *Anaplasma*, *Rickettsia rickettsi* and *Borrelia burgdorferi* (MASSARD & FONSECA, 2004).

Amblyomma genus is geographically distributed in all continents (with an exception of Antarctic), with a latitude range of 40º North and South. Approximately 106 species have been described around the world, half of these in the Americas, few in Australia, only one in Europe and the rest in Africa and Asia. It is known 57 species of the *Amblyomma* genus in the Neotropical region, 45 are exclusive of this region, 12 occur in Nearctic region and only one is not autochthonous of the America (BARROS-BATTESTI et al., 2006).

Ticks that belong to *Amblyomma* genus are cosmopolitan ectoparasites that parasites a wide variety of animals (ONÓFRIO, 2007), including almost all species of synanthropic mammals, wild and domestic, and humans. They also parasites birds, reptiles and amphibians (ARAGÃO, 1936, BARROS & BAGGIO, 1992, BARROS-BATTESTI et al., 2006), 33 species are found in Brazil (GUIMARÃES et al., 2001). Because they have low specificity (MARQUES et al., 2006), they have an important role in the transmission of pathogens to animals and humans and between hosts. The present study had as aim to report parasitism, by ticks, in humans in Maranhão State, Brazil.

MATERIALS AND METHODS

During the period of the activity research, 2005 to 2011, in the Area of Environmental Preservation (AEP) of Inhamun, Maranhão State, Brazil, it was seen the presence of ticks in humans body (34 especimens) and in the clothing (15 specimens). The specimens were collected in 11 researchers along this period and in different opportunities. AEP is located in the east-central region of Maranhão State, in the township of Caxias, between the coordinates 43º 20’ 54’’Longitude and 40 51’ 30’’ Latitude, with a range of annual rainfall of 300 to 2,000mm, temperature range of 20º and 28ºC and an area of approximately 4,500 hectares. Located in the left side of BR-316, 4km from the urban zone of Caxias, it has trees of small, medium and large size been similar to the savannah with large trees. It belongs to Itapecuru’s physiographic region, which is the major river of Caxias microregion.

The ticks seen in the clothing and the ones fixed in the researchers’ body were collected, placed in eppendorfs containing 70% alcohol and sent to the Parasitology Laboratory of Universidade Estadual do Maranhão for specific identification. The specimens were examined under a stereomicroscope and identified according to identification keys of BARROS-BATTESTI et al., (2006). The voucher specimens were deposited in zoological collection of Butantan institute with number 10991,

10989 and 10988.

RESULTS AND DISCUSSION

Forty nine tick specimens were collected (31 females, 16 males and 2 nymphs). Thirty one of them were *Amblyomma cajennense* species, (23 females and 8 males) and, one female and 2 nymphs of *Ambyomma parvum* (Aragão). They were parasitizing the following body regions: interdigital space of the hands, arms, legs, thigh, head (scalp), neck, buttocks and pubic. The rest (8 males and 7 females) was found in the researchers' clothing and identified as *A. cajennense*.

When humans work out in the field, the risk of parasitism by ticks is double (SERRA-FREIRE, 2010), representing a potential risk to the host. Regarding to *Amblyomma* genus, ARAGÃO & FONSECA (1961) affirm that the parasitized people are mainly the ones that go into the woods, corroborating with this study and others that reports the parasitism in people who visited the countryside (GUIMARÃES et al., 2001, MARQUES et al., 2006, ONOFRIO, 2007, SOARES et al., 2007).

GUGLIELMONE et al. (2006) verified the existence of 28 species that parasitizes humans distributed in the following genus: *Amblyomma*, *Boophilus*, *Dermacentor*, *Haemaphysalis*, *Ixodes* and *Rhipicephalus* when they did a review and tick register study in South America's collection. Other than that, 20 new species were registered for different locations.

Amblyomma genus is well represented in South America, with over than 50 species described (GUGLIELMONE et al., 2006). ESTRADA-PEÑA & JONGEJAN (1999) related that a total of 21 species of *Amblyomma* were collected in human beings, more specific, in Brazil. Other authors have described parasitism in humans (ARAGÃO, 1912, ARAGÃO & FONSECA, 1961, LEMOS et al., 1997, ARZUA et al., 2005, RAMOS et al., 2010, SERRA-FREIRE, 2010, ONOFRIO et al., 2010), as reported in the present study.

SERRA-FREIRE (2010) related the occurrence of larvae, nymphs and adults of *Amblyomma varium*, *A. cajennense*, *A. aureolatum*, *A. brasiliense*, *A. dubitatum*, *A. longirostre* in Pará state. The parasitism was observed in locals and tourists, noting that the highest rate of parasitism were adults and field workers, followed by the students. MARQUES et al. (2006) found a female specimen of *Amblyomma fuscum* in the palm of the hand in a researcher at Guarujá township, in São Paulo State and another tick of the same species in Florianópolis, in Santa Catarina State, that was fixed to a person's ankle. These registers, added to the ones presented here, show that different body regions can be a fixation site for the ticks.

A. cajennense has a significant distribution in South America, been seen parasitizing humans in various countries: Argentina, Bolivia, Brazil, Colombia, Ecuador, French Guiana, Guiana, Paraguay, Suriname and Venezuela (GUGLIELMONE et al., 2006). Here in Brazil these ticks were described attached to humans, in different states: Amazonas, Mato Grosso, Mato Grosso do Sul, Minas Gerais, Paraná and São Paulo (ARAGÃO & FONSECA, 1961, ARZUA et al., 2005, LEMOS et al., 1997). They are also cited in other states exercising haematophagy in humans: Distrito Federal, Goiás, Pará, Rio de Janeiro and Roraima (GUGLIELMONE et al., 2006), although this specie is widely distributed through South America and Brazil, there is not data published reporting the parasitism in humans in Maranhão by this tick specie.

GUGLIELMONE & NAVA (2006) state that adults *A. parvum* frequently parasitize domestic animals. This tick species had been reported parasiting domestic

and wild animals (GUGLIELMONE & VIÑABAL, 1994, NAVA et al., 2006).

In Brazil human parasitism by *A. parvum* was registered in state of Rio Grande do Norte (FERREIRA et al., 2008), Bahia (GUIMARÃES et al., 2001), Goias, Mato Grosso do Sul, Piaui and in Maranhão in the locality of Aldeia do Porto. Now been also reported in Caxias.

The species of *Amblyomma* are generally shown parasitizing humans all over the world, giving emphasis to the medical importance of this group and, because they have low host specificity; mainly in the larvae and nymph stages, the species that belongs to the genus *Amblyomma* requires close attention, because they are vectors of multiple pathogenic agents. Also, the presence of *A. cajennense* is worrying because it is known that it is the vector of *Rickettsia rickettsia*, etiological agent of the Brazilian Rocky Mountain Fever, a disease with proved occurrence in Brazil in the states of São Paulo, Minas Gerais, Rio de Janeiro, Espírito Santo, Santa Catarina, Distrito Federal, Bahia, Amapá and Rondônia.

Besides protozoan parasites, virus and bacteria can also be transmitted by ticks as pointed out by MASSARD & FONSECA (2004). That is why RAMOS et al. (2010) emphasis the importance of studies related to human parasitism by ticks and also alert to the necessity of preventive measures in order to avoid such parasitism when human activities are developed in rural or forest environment, specially because the species of *Amblyomma* have low parasitary specificity, they can infest an wide range of mammalian hosts and therefore its presence and dispersion in these area is facilitated.

Another point that must be taken into account is that in Brazil the ecological tourism is expanding, leading people to the risk of infestation by ticks so prevention is necessary. The Brazilian government is aware of the problem as the example of the Secretaria de Estado da Saúde –Superintendência de Endemias – SUCEN that has written a Manual of Acarological Surveillance with the aim to alert and give guidelines to the professionals and to the population about the ticks and their importance to public health, as weel as preventive measures.

CONCLUSION

The Area of Environmental Preservation of Inhamun is an area of preservation, and it is also open to public visitation, as well as an area of scientific research, therefore humans are exposed to the risk of infestation by these arthropods. Thus being of major importance the placement of control methods and collection of specimen for specific diagnosis.

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